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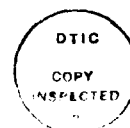20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

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ABSTRACT

Self-efficacy theory states that performance is best predicted by carefully assessing an individual's self-efficacy expectations. Self-efficacy expectations are the output of a central processor of relevant information. Bandura has proposed that other variables affect performance indirectly through the self-efficacy central processor. This paper reports the results of two studies which evaluated the possibility of a person's plans for performing a specific behavior having a direct, unmediated effect on performance. One study used dominating a ten minute conversation as the experimental task. For this study, 70 male and 82 female undergraduate students were the subjects. These subjects wrote out plans for dominating a conversation, indicated their satisfaction with their plans, and recorded their self-efficacy expectations for actually dominating the conversation. The performance measures were coder ratings of dominance and proportion of total time the subject talked. Their conversations were with specially trained confederates. The subjects for the other study were 107 students in a school for training court reporters. They wrote out plans for taking down and transcribing question and answer testimony. They also completed forms indicating their satisfaction with their plans, and their self-efficacy expectations for

the task.   The performance measure was the score on the
final copy of a transcript of question and answer testi-
mony.   Path analyses supported the proposed model which
includes a direct effect of the quality of plan on per-
formance.   Results of additional analyses suggest that
the quality of a person's plan for performance may be
helpful in explaining discrepancies between expected and
actual performance.   Implications of an elaborated
self-efficacy model are discussed for therapy and educa-
tion.

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SELF-EFFICACY THEORY

Author: Capt Karl O. Moe

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a. (Yes)*   b. No

2. Do you believe this research topic is significant enough that it would
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RICHARD R. EILES, LT COL, USAF, BSC
Associate Chief, Biomedical Science Corps for Clinical Psychology
Name, Grade, Position
Department of Mental Health/SGHMSC
Wilford Hall USAF Medical Center
Lackland AFB, TX 78236   USAF SCN 75-20B
Organization/Location

* I am not aware of a specific Air Force project to where this research addresses itself. However, the theoretical research does have relevance both for psychotherapeutic techniques used by Air Force clinical psychologists and enhancement of task performance in Air Force personnel.

The results support the notion that good planning combined with a person's confidence in his ability to perform a task or change a behavior will lead to "better performance."

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PLANS, CONFIDENCE, AND PERFORMANCE:

AN ELABORATION OF SELF-EFFICACY THEORY

by

Karl O. Moe

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

ARIZONA STATE UNIVERSITY

May 1982

ABSTRACT

Self-efficacy theory states that performance is best predicted by carefully assessing an individual's self-efficacy expectations. Self-efficacy expectations are the output of a central processor of relevant information. Bandura has proposed that other variables affect performance indirectly through the self-efficacy central processor. This paper reports the results of two studies which evaluated the possibility of a person's plans for performing a specific behavior having a direct, unmediated effect on performance. One study used dominating a ten minute conversation as the experimental task. For this study, 70 male and 82 female undergraduate students were the subjects. These subjects wrote out plans for dominating a conversation, indicated their satisfaction with their plans, and recorded their self-efficacy expectations for actually dominating the conversation. The performance measures were coder ratings of dominance and proportion of total time the subject talked. Their conversations were with specially trained confederates. The subjects for the other study were 107 students in a school for training court reporters. They wrote out plans for taking down and transcribing question and answer testimony. They also completed forms indicating their satisfaction with their plans, and their self-efficacy expectations for

the task. The performance measure was the score on the
final copy of a transcript of question and answer testi-
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includes a direct effect of the quality of plan on per-
formance. Results of additional analyses suggest that
the quality of a person's plan for performance may be
helpful in explaining discrepancies between expected and
actual performance. Implications of an elaborated
self-efficacy model are discussed for therapy and educa-
tion.

DEDICATION

To Lanesta

For her help, love and understanding

ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

Bandura (1977a, 1977b) and others (Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977; Bandura, Adams, Hardy, & Howells, 1980) have developed a concept of self-efficacy which they believe can be used to make better predictions of behavior than can be made by using past performance. They make a distinction between self-efficacy expectations and outcome expectations. Figure 1 illustrates where each of these fits into a symbolic model of behavior. Essentially, a self-efficacy expectation is a person's prediction about his/her ability to actually perform a given behavior. The associated outcome expectation is a person's prediction about what will happen if this behavior is actually performed. Bandura defines self-efficacy expectations by contrasting them to outcome expectations.

> An outcome expectancy is defined here as a person's estimate that a given behavior will lead to certain outcomes. An efficacy expectation is the conviction that one can successfully execute the behavior required to produce the outcomes. Outcome and efficacy expectations are differentiated because individuals can come to believe that a particular course of action will produce certain outcomes, but question whether they can perform those actions. (Bandura, 1977b, p. 79)

Self-efficacy is seen as affecting whether or not a person will even attempt a specific behavior and how persistently a person will continue to attempt a behavior in the face of difficulties. Bandura (1981; Note 1) further points out that

Figure 1

Diagrammatic representation of the difference between
efficacy expectations and outcome expectations (Bandura,
1977b).

Stimulus ⟶ Person ⟶ Behavior ⟶ Outcome
(S)   (O)   (R)   (S)

Self-
efficacy
expectation

Outcome
expectation
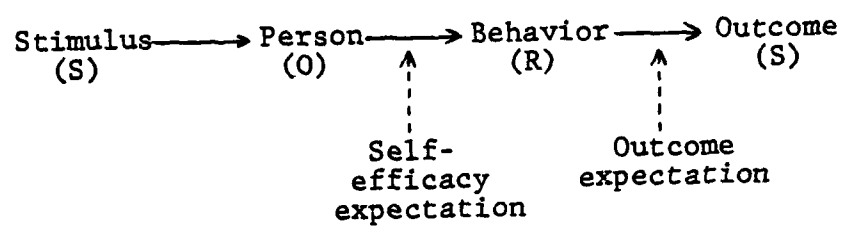
> self-efficacy is . . . concerned with judgments about
> how well one can organize and execute courses of action
> required to deal with prospective situations containing
> many ambiguities and unpredictable events. (p. 1)

An important point to note is that here Bandura is refer-
ring to judgments about specific "prospective situations"
rather than the more global judgments to which internal-ex-
ternal locus of control, self-esteem, self-confidence, and
other similar constucts refer. Self-efficacy expectations
are the result of a person's judgment of his/her ability to
combine appropriate cognitive and motor skills into an inte-
grated course of action aimed at performing a specific
behavior (Bandura, 1981; Note 1). With this in mind, it
becomes clear that cognitive as well as behavioral experi-
ences will affect perceived efficacy. Bandura and Adams
(1977) and Bandura et al. (1977) found that behavioral expe-
rience had the strongest effect on modifying self-efficacy;
however, Bandura (1977a, 1977b, 1981) additionally suggests
that vicarious experience, verbal persuasion, and emotional
arousal may affect self-efficacy expectations.

The original empirical support for this theorizing con-
sisted of two studies done with snake phobics. Bandura et
al. (1977) compared the effects on self-efficacy and on
actual performance of two treatment methods derived from
social learning theory. They found that participant model-
ing led to "higher, stronger, and more generalized expecta-
tions of personal efficacy than did treatment relying solely
upon vicarious experience" (p. 125). They also found

self-efficacy expectations to be a better predictor of future behavior than previous performance.

Bandura and Adams (1977) suggest that systematic desensitization with snake phobics operated by creating and strengthing expectations of personal efficacy. They also investigated the relationship between self-efficacy and performance changes during the course of treatment using participant modeling. They found that performance of a response in a response hierarchy led to increased self-efficacy expectations with respect to responses higher in the hierarchy. These increased expectations were normally followed by improvement in performance of that higher response. An essential point which Bandura makes is that all changes can be seen in terms of changes in self-efficacy expectations. This includes changes in therapeutic interventions other than treatment of snake phobics. He states "that psychological procedures, whatever their form, alter the level and strength of self-efficacy" (Bandura, 1977a, p. 191). In other words, therapies which lead to changes in behavior do so by changing expectations of self-efficacy. If these changes in self-efficacy feelings do not occur, it is unlikely that any changes or improvements in behavior will occur. Although persuasion, vicarious experience, and emotional arousal may alter self-efficacy expectations and thereby affect behavior, actual "hands-on" experience--enactive performance of behaviors--leads to the largest

changes in self-efficacy.

Although Bandura emphasizes using self-efficacy to pre-
dict improvements in behavior or, more generally, to predict
changes in behavior, self-efficacy expectations predict
behavior even when changes in behavior are not an issue.
This has been most clearly demonstrated in initial evalua-
tions--pretreatment testing. When people believed they
could not approach a snake, they ususally could not. Simi-
larly, Schunk (1981) found at post-test his four groups of
children showing low arithmentic achievement accurately pre-
dicted the arithmetic problems they could do 72 percent of
the time on the average.

Bandura (1981) points out that self-efficacy expecta-
tions can vary on several dimensions, each of which has
important implications for performance. For this reason,
Bandura's work always includes three measures of self-effi-
cacy: Magnitude, strength, and generality. He writes else-
where that these three dimensions must be measured with the
same precision that is used when measuring changes in behav-
ior (Bandura, 1977b).

Magnitude, which gives an estimate of how many tasks in
a hierarchy will be attempted, is simply the number of tasks
or behaviors in the hierarchy that a subject believes he/she
can do with a certain level of confidence. In Bandura's
work with snake phobics a confidence level of greater than
10 percent certainty was required in order for an item to be

included in the magnitude score, but other levels have been tried and have shown some advantages (Bandura et al., 1980; Bandura & Schunk, 1981; Schunk, 1981).

The strength score is an arithmetic average of the confidence ratings, which range from 0 to 100, for all the tasks in a hierarchy, including tasks for which the subject's confidence is zero. Bandura (1977a) argues that strength indicates how persistent and intense a person's efforts will be. He states that

> Weak expectations are easily extinguishable by disconfirming experiences, whereas individuals who possess strong expectations of mastery will persevere in their coping efforts despite disconfirming experiences. (Bandura, 1977a, p. 194)

Brown and Inouye (1978) found, as Bandura predicted, that strength of self-efficacy predicts whether people give up in the face of repeated failures or intensify their efforts. The higher people's self-efficacy expectations, the more persistently they will try. Similarly, Schunk (1981) found that self-efficacy expectations accounted for 11 percent of the variation observed in posttest persistence. In work with children having trouble with arithmetic, Bandura and Schunk (1981) found correlations between strength of self-efficacy expectations and perseverance ranging from .51 to .63.

Generality, as defined in this context, is determined by asking about self-efficacy expectation with respect to similar and dissimilar situations. For his snake phobia

work. Bandura asked about approaching a different snake for a similar situation and approaching other animals and social situations for dissimilar situations (Bandura & Adams, 1977). In the studies using arithmetic skills, the generality tests involve problems that are more difficult than the problems used in treatment and instruction.

To determine how expectations of self-efficacy affect actual performance, Bandura uses a "microanalytic methodology." Microanalysis means looking at the discrepancy between self-efficacy expectations and the actual behavior(s) demonstrated. This is done for all tasks in a hierarchy taking one task at a time. To be meaningful, subjects must clearly "understand what kind of behavior will be required and the circumstances in which they will be required to perform them" (Bandura, 1977a, p. 204). This means that each task must be fairly specific and, Bandura suggests, "preferably ordered by level of difficulty" (Bandura, 1977a, p. 204). Bandura has described the development and use of these procedures in work with snake phobics (Bandura, 1977a; Bandura & Adams, 1977; Bandura et al., 1977). He has also developed a means of assessing self-efficacy with respect to a number of tasks and situations relevant to agoraphobia. The tasks he uses include, for example, leaving home, going to restaurants, and being in groups (Bandura et al., 1980; Bandura, Note 2).

Self-efficacy theory has been investigated in a variety

of areas. As noted above, Bandura's research originally focused on phobic behaviors. The first two studies reported involved snake phobics (Bandura & Adams, 1977; Bandura, et al., 1977). More recently, he has used severely agoraphobic subjects (Bandura et al., 1980).

Schunk (1931) and Bandura and Schunk (1981) have extended self-efficacy theory into more cognitive areas. Both studies found that self-efficacy expectations accurately predicted the arithmetic performance of children who had been showing low arithmetic achievement. This finding held across levels of task difficulty and treatment modes.

Moe and Zeiss (in press) have extended self-efficacy theory to the area of social skills. They have developed a questionnaire which seems to adequately assess self-efficacy expectations for a variety of social skills in a number of social situations. Zeiss, Moe, Stanwood, and Sullivan (Note 3) are currently in the process of validating this questionnaire further. Sullivan (Note 4) has started to look at self-efficacy in the context of assertiveness training. The thrust of this study will be to document that changes in self-efficacy expectations for social skills do occur as a result of skill training. Additionally, it will be possible to look at the extent to which generalization does occur for social skills that are not focused on by the training package.

Bandura (1981, in press) has addressed self-control in

the context of self-efficacy theory. To date though, Bandura's efforts in this area have been on a theoretical level rather than an empirical one. Condiotte and Lichtenstein (1981) present the only self-control study involving self-efficacy expectations reported so far. They found that self-efficacy expectations were able to predict which subjects in smoking cessation programs would relapse and when they would relapse. Multiple correlations, corrected for shrinkage, were $\tilde{R}$ = .57 for relapse and $\tilde{R}$ = .69 for time to relapse.

One of the common objections to self-efficacy theory has to do with the causal relationship between self-efficacy expectations and actual performance. In other words, do changes in self-efficacy expectations precede changes in performance, as Bandura states, or do they follow changes in behavior, or perhaps, do both change at the same time as the result of changes in some third variable? Moe and Zeiss (Note 5) have begun investigating the question of direction of causality using a perceptual motor task. Initial results suggest that at least for this kind of a task, changes in self-efficacy expectations may lag behind changes in performance as subjects are learning a new perceptual motor task.

Bandura presents no data specifically addressing this issue. However, he does present a logical argument based on the available empirical data. He concludes by stat. ~q,

> Any alternative causal explanation for different lines
> of evidence would have to invoke a superordinate media-
> tor that controls both efficacy judgment and behavior.
> Such a mediator would have to be an exceedingly complex
> one to account for the diverse sets of relationships.
> To cite but a few examples, it would have to affect
> differentially efficacy judgments and behavior result-
> ing from maximal enactive mastery; it would have to
> produce different levels of self-efficacy from equiva-
> lent reductions in experienced fear arousal and cogni-
> tive mastery; it would have to produce variable effi-
> cacy judgments from similar partial mastery
> experiences; and it would have to explain congruence
> between efficacy judgment and behavior across markedly
> different types of behavior. (Bandura et al., 1980, p.
> 62)

Schunk (1981) has shed some light on the causal rela-
tionships among the variables involved. In line with self-
efficacy theory, he hypothesized that treatment (for arith-
metic deficiencies) would affect accuracy and persistence
indirectly through self-efficacy. However, path analysis of
his data did not support his model. His data were consist-
ent with a model that also included a direct path from
treatment to accuracy. Schunk's analysis suggests, among
other things that a model postulating a causal relationship
between self-efficacy and behavior with self-efficacy pre-
ceding behavior is tenable. However, more research on cau-
sality is needed.

The discrepancies that sometimes occur between self-ef-
ficacy expectations and actual behaviors are another point
of interest in self-efficacy theory as it stands now. In
his work with snake phobics, microanalysis revealed discre-
pant predictions 10 to 25 percent of the time (Bandura &
Adams, 1977; Bandura et al., 1977). In work with

agoraphobics, Bandura found discrepancies in predictions 24 percent of the time at pretreatment assessment. After treatment, discrepancies in predictions occurred from 11 to 19 percent of the time depending on the treatment group. Bandura found the subjects who were in the participant modeling and vicarious modeling groups showed a slight but non-significant tendency to overestimate subsequent performance. Subjects who were in cognitive modeling and desensitization groups showed slight but also nonsignificant tendencies to underestimate subsequent performance.

In work with children showing poor arithmetic achievement, higher discrepancies have been found. Schunk (1981) reports discrepancies between predictions and performance 15.3 to 41.7 percent of the time depending on the treatment group and degree of training on the type of problem asked about. Bandura and Schunk (1981), similarly, found discrepancies between self-efficacy expectations and performance from 20 to 49 percent of the time with overestimates being the most common direction for errors.

Although it is true that self-efficacy predictions provide for a fairly good hit rate, it does seem curious that people are wrong about what they will do 10 to nearly 50 percent of the time. These discrepant predictions are discussed briefly by Bandura (1981). For example, he suggests that physical or social constraints may limit performance. Lack of incentive could lead to a discrepancy between self-

efficacy judgments and actual performance. Finally, he suggests that the self-efficacy expectations may simply be wrong due to insufficient experience with the task or to personal factors which distort judgments. This discussion of discrepancies from predictions is intuitively appealing but adds very little in terms of an explanation for what happens and why. Further, it does not provide any basis for predicting whether discrepant estimates will be overestimates or underestimates.

Plans and Behavior

At various times psychologists have proposed that plans for beahvior are important determinants of actual behavior. For example, Miller, Galanter, and Pribram (1960) developed a theory of behavior that was based on a notion of plans as the basic explanatory structure determining the behaviors engaged in. They define a plan as "any hierarchical process in the organism that can control the order in which a sequence of operations is to be performed" (p. 16). They state that "any complete description of behavior should be adequate to serve as a set of instructions; that is, it should have the characteristics of a plan that could guide the action described" (p. 16). It is in this same sense that this paper uses the word "plan." That is, a plan is a set of instructions that a person uses to guide behavior. Miller and his colleagues suggested not only that plans are basic to discussing behavior but also that plans for human

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behavior can be discussed effectively in terms of information processing and computer analogies. Shallice (1972) walking through this opened door, has published one of the better information processing models of consciousness and behavior. He postulates "action systems" each of which has a goal or set of goals. When a particular action system becomes activated by input from either perceptual or motivational systems or other action systems, it pursues a particular goal by implementing a sequence of actions. The important point for this discussion is that there is a sequence of actions, analogous to steps in a computer program, which is available for use by the action system in obtaining its goal. In the terms of the model proposed below, the sequence of actions is the plan for behavior.

More recently, Carver and Scheier (1981) have discussed attention and self-regulation as basic elements of a control theory of human behavior which they propose as a means of integrating a number of areas of psychology. Again, the relevant point for this discussion is that they assume the existence of programs or plans to use for directing behavior.

Reason (1979) has taken an interesting look at what is happening when actions do not go as planned. But, again, the assumption is that behavior is planful and that it makes sense and is possible to talk about the plans people have or can generate for their behavior.

However, another line of research raises questions about the reasonableness of talking about, much less doing research that depends on identifying the plans that people have for their behaviors. Nisbett and Wilson (1977), as well as others (Jaynes, 1976), present data which suggests that, even if plans exist, they may not be knowable by the people who use them. Even if people are somehow aware of their plans, they may not be able to verbalize them. Further, if a plan is verbalized, it may not reflect the plan actually used.

Nisbett and Wilson's (1977) research suggests specfically that people may have little or no direct awareness of their cognitive processes. Their research included both retrospective as well as predictive tasks. Of particular interest for the present paper is their analysis of Maier's (1931) study on problem-solving. They point out that people, including great mathematicians, scientists, writers, and philosophers, as well as Maier's more ordinary subjects may be able to state the solution to a problem but are unable to accurately describe the process through which they arrived at their solutions.

Nisbett and Wilson's conclusions, as a minimum, suggest a threat to the model proposed later in this paper. To the extent that people are unable to accurately state a plan for what they intend to do, the model would be untestable. However, Nisbett and Wilson did not actually ask their subjects

the kinds of questions that are necessary to test the proposed model since they were interested in answering different questions. Testing the model proposed by this paper requires asking subjects what their plans are for performing a specific task. That is, asking "How are you going to go about doing this?" The answer to this question does not necessarily require an introspective self-report of how a person developed a plan for doing the task in question. All that is required is for the person to report the outcome or product of his/her mental process. It seems reasonable to consider a verbalized plan to be a product of a mental process (White, 1980), which, Nisbett and Wilson state is quite knowable. However, it remains to be seen how well people can state plans for a task in advance and how useful and accurate those plans prove to be.

Mischel and Patterson (1976, 1980; Patterson & Mischel, 1975) have come the closest to investigating these specific questions. They provided children with a variety of kinds of plans for resisting temptation and looked at the relationships between these plans for resisting temptation and the behavior of actually resisting temptation. They found that having an appropriate plan made a significant difference in children's ability to resist temptation. Their work suggests that, for preschool children, elaborated plans are superior to unelaborated plans. Suggesting a generally successful strategy (e.g., "Think of something to remind you to

not be distracted") did not lead to as good a performance as
suggesting a more complete strategy (e.g., "Think of some-
thing you can say to remind you to not be distracted. For
example, you could say, 'I'm not going to let Mr. Clown box
pester me.'"). They also found that plans for inhibiting
temptations ("I'm not going to be distracted by that") are
more effective than plans reminding the child of pleasant
consequences ("If I work now, I can play with the fun toys
later"). Both of these kinds of plans are superior to plans
which are task-facilitating ("I am going to do this work
now") and to irrelevant plans or no plans at all. They con-
clude that plans, even relatively simple plans, can have an
important effect on performance and that it will be impor-
tant to look at other aspects of the relationship between
plans and behavior (Mischel & Patterson, 1980).

Plans and Self-efficacy: A Proposal for a Revised Model

This study proposes an elaboration of Bandura's self-
efficacy theory (Bandura, 1977a, 1977b, 1981, in press)
which incorporates the idea of plans for behavior. This
elaborated model states that both self-efficacy expectations
and performance can be discussed in terms of the quality of
the plan a person has for performing a specific behavior
(See Figure 2). The validity and adequacy of this elabo-
rated model were investigated in two different kinds of
experimental tasks. One task involved social behaviors.
The other task involved cognitive and motor skills.

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Figure 2

Proposed model incorporating the notion of plans for
behavior.

Objective Quality:
completeness,
accuracy

Plan for
Behavior

Subjective
Satisfaction
with Plan

Self-efficacy
expectations

Intentions

Performance —→ Outcome

Outcome
Expectation
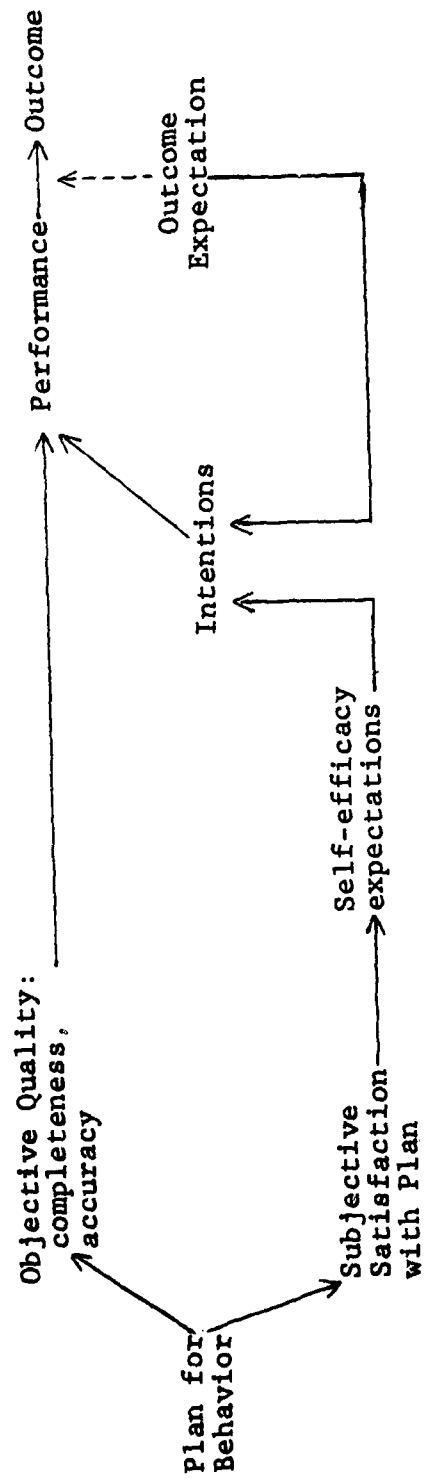
As mentioned above, a plan is thought of as something which is used to guide behavior. A plan may be a visual image, as is sometimes used for training athletes (Gallwey, 1974). A plan can also be a verbal set of step-by-step instructions. Plans can vary in terms of completeness and accuracy. A complete, accurate plan should ordinarily lead to good performance. Actually, several researchers and theorists have previously discussed this relationship between the quality of a plan (good, fair, poor) and the performance of behaviors based on that plan. Although they do not focus on this relationship, Miller, Galanter, and Pribram (1960) do make it clear that they believe plans must be at least adequate for performance to turn out as desired.

Reason (1979) provides some data which clearly suggest that inadequate plans lead to unintended results. Although his data are somewhat informal and only on situations where the results are unintended, Reason's analysis suggests that plans go awry when they are not complete--especially when they lack adequate control steps and steps for checking progress.

Clearly, the complexity of the task will be a major determinant of how accurate and complete a plan must be to lead to a good performance. Fairly simple tasks require only a simple plan. Building a square sided box requires much less of a plan than building a three bedroom house. Reading a book requires a less complete plan than writing

one. In general, a plan that is adequate to the task in
question should lead to better performance than a plan that
is inadequate. Miller et al. (1960) suggest that plans are
not necessarily static and may even be improved upon as they
are being executed. This is consistent with the experience
of starting a project without really knowing what to do.
Unless the task is very time limited it may be possible to
figure out what to do while working on the task. In this
kind of situation, although the initial plan was inadequate,
the final plan could very well be even better than necessary
to provide for a good performance.

So far the quality of plans has been discussed in terms
of objective judgments. That is, trained judges using
objective criteria could rate a plan as adequate or inade-
quate to the task in question. In a similar vein, each
individual could, if asked, probably rate his/her plan for
adequacy using whatever internal standards were usually
used. In the present model, this subjective judgment made
by the individual is referred to as satisfaction with the
plan. Additionally, each individual could then indicate
whether the plan was adequate for him/her considering the
task, the situation, his/her abilities, past experiences,
current physical and mental condition, and whatever other
factors seemed relevant. This second subjective judgment
is, in effect, the individual's self-efficacy expectation
for the behaviors being considered. Satisfaction with the

plan is proposed as a major determinant of self-efficacy.
The other determinants of self-efficacy involve estimates of
the individual's ability to carry out the plan in the spe-
cific situation being considered.

It is assumed that people will ordinarily generate
plans that they can carry out themselves. In other words,
when thinking about how to do a task, people will take their
own abilities, the situation, their past experiences, knowl-
edge of what works for others, and so forth into account as
they develop or select their plan. It is assumed that when
people have a good plan--that is, the plan is objectively
complete enough and accurate enough for the task--they will
have a feeling of knowing what to do. They will be satis-
fied that the plan is a good one and simultaneously that it
takes into account their own abilities to do the task in the
situation in which it must be done. Therefore, if asked a
self-efficacy question, they will indicate they can do the
behavior and will indicate fairly high confidence that they
can do it.

On the other hand, when people have a plan that is
objectively incomplete or inadequate for performing a spe-
cific behavior, it is assumed that they would usually recog-
nize that it is a poor plan and be dissatisfied with their
plan. They would predict that they could not do the task as
described. These two sets of circumstances would account
for the fairly high congruence found between self-efficacy

expectations and performance (Bandura & Adams, 1977; Bandura et al., 1977; Bandura et al., 1980; Bandura & Schunk, 1981; Schunk, 1981). Specifically, a good plan should lead to satisfaction with the plan and be associated with both good performance and high self-efficacy expectations (See Figure 3a). A poor plan coupled with recognition that the plan is poor should lead to dissatisfaction with the plan, low efficacy expectations, and poor performance (See Figure 3b). In these situations, the proposed model probably does not lead to predictions different from those made by the basic self-efficacy model. However, as discussed above, self-efficacy theory does not address the 10 to nearly 50 percent of the situations where the expectations that subjects express are not met. The proposed model provides a framework for describing what happens and for predicting the direction of the discrepancies.

In one situation, a person may have a perfectly good plan but may be dissatisfied with the plan. In this case, the person would be likely to have low self-efficacy expectations; but, if pushed into trying to perform the behavior, would do well (See Figure 3c). This situation describes a compulsive person whose internal standards require that each and every detail be nailed down in advance. Some behaviors do not require extremely detailed plans. A yard can be mowed with only a sketchy plan. Alternatively, a person with a good plan may recognize that the plan is good--that

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Figure 3

Diagrammatic representations of various situations
where self-efficacy expectations are congruent or
incongruent with performance.

Congruent Situations

Good Plan————————————————————————→ Good Performance
↘ Satisfaction———→High Self-
efficacy

a

Poor Plan————————————————————————→Poor Performance
↘ Dissatisfaction—→Low Self-
efficacy

b

- -

Incongruent Situations

Good Plan————————————————————————→Good Performance
↘ Dissatisfaction—→Low Self-
efficacy

c

Good Plan————————————————————————→Good Performance
↘ Satisfaction———→Low Self
efficacy

d

Poor Plan————————————————————————→Poor Performance
↘ Satisfaction———→High Self-
efficacy

e
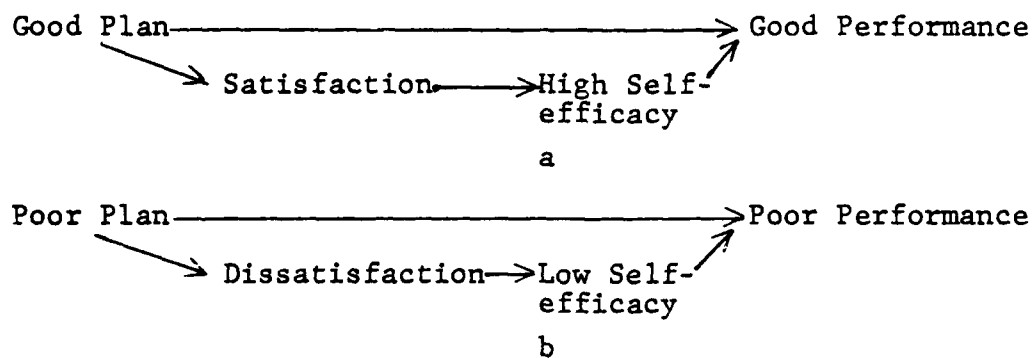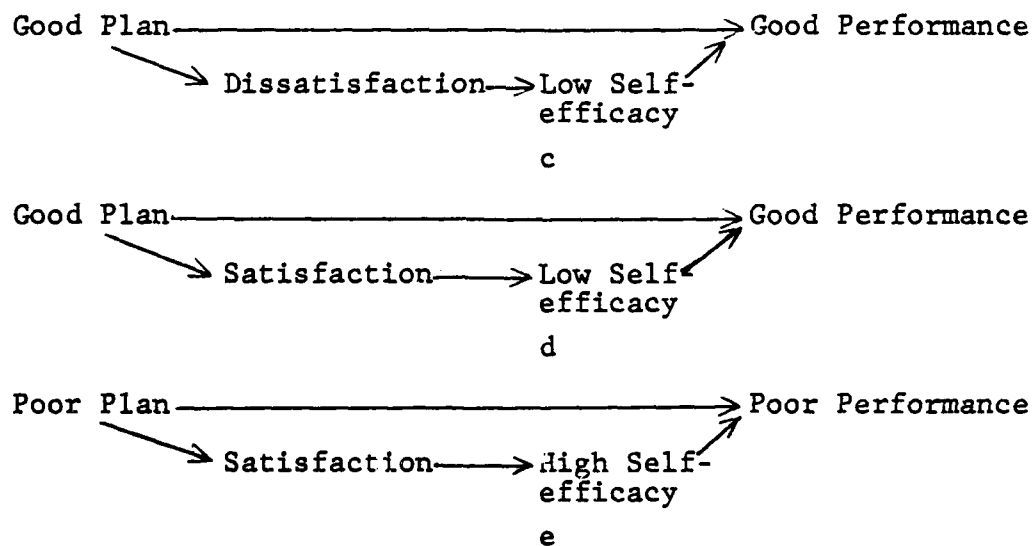
is, be satisfied--but doubt his/her ability to carry it out due to perceived lack of skill, environmental constraints which may present themselves, or a general self-doubt. This is a situation which could also lead to good performance despite low self-efficacy expectations (See Figure 3d). This situation would describe a person who once was a good weather forecaster but due to a period of extreme emotional distress now believes that he can no longer do much of any- thing well, including making a weather forecast despite the fact that he is fully aware that he knows how to. If for some reason he were forced into making a forecast, it would be as accurate a forecast as anyone can make.

Discrepancies between self-efficacy expectations and behavior can also occur when a person overestimates what he/she will do. In terms of the proposed model, this occurs when a person has an objectively poor plan but for some rea- son believes that it is satisfactory. This inadequate plan is most likely to lead to poor performance while the indi- vidual's satisfaction with the plan should lead to high self-efficacy statements (See Figure 3e). This situation can occur when a task is new or the environment surrounding the task has changed. For example, a good high school stu- dent may find that he/she does not get an A on his/her first college term paper despite high efficacy expectations.

In summary, then, the proposed model suggests that both self-efficacy expectations and performance are related to

the plan for behavior that a person has or is able to generate. A person's satisfaction with his/her plan is a major contributer to self-efficacy expectations. Performance depends, in large part, on how objectively adequate the plan is, as well as self-efficacy expectations.

Other Aspects of the Proposed Model

Actual performance of behaviors also depends on variables other than adequacy the person's plan and the person's satisfaction with that plan. For one thing, it depends on the person's intention to perform the behavior. This is similar to the ideas proposed by Fishbein and Ajzen (19,?) and discussed by Bentler and Speckart (1979). In terms of the proposed model, intention is determined by the outcome expectancy--that is, the payoff--and self-efficacy expectations. The outcome expectancy, as proposed by Bandura (1977a), is simply the person's belief about what will happen if a specific behavior is performed. Self-efficacy expectations enter into intention as a measure of how certain the person is that he/she can perform the behavior.

Hypotheses

The studies done for this paper did not attempt to validate this entire model. Instead they focused on the relationships among four variables and attempted to hold the other variables constant. Hypotheses were made about the relationships among (a) the quality of the plan, (b) satisfaction with the plan, (c) self-efficacy expectations, and

(d) performance of task behaviors. The major hypotheses were as follows: .

1. There will be a significant, positive relationship between the objective quality of the plan and performance.

2. There will be a significant, positive realtionship between the objective quality of the plan and satisfaction with the plan.

3. There will be a significant, positive relationship between satisfaction with the plan and self-efficacy expectations.

4. There will be a significant, positive relationship between self-efficacy expectations and performance.

5. The relationship between the quality of the plan and performance will be consistently larger than the relationship between self-efficacy expectations and performance. The zero-order correlations may not be significantly different but across both studies the direction of the difference will always be the same. Additionally, the part correlations between quality of the plan and performance holding self-efficacy constant and between self-efficacy and performance holding quality of the plan constant will be compared. It is predicted that the part correlation between quality of the plan and performance will be significantly larger.

Path analyses will be used to evaluate whether the relationships specified by the proposed model are consistent

with the data.

One additional exploratory hypothesis was investigated. It was predicted that when there are discrepancies between self-efficacy expectations and performance, good plans will be found in those cases where performance is underestimated and poor plans will be found in those cases where performance is overestimated.

Experimental Tasks

These hypotheses were evaluated in two separate experimental tasks. Two different kinds of tasks were used in order to allow for conceptual replication and validation of the proposed model. The tasks were chosen for lack of overlap in the skills and abilities needed. Also, it was possible with these tasks to elicit the maximum possible motivation by arranging for positive outcome expectancies. Additionally, each of the tasks was such that a plan for performing them could be objectively rated and performance could be objectively measured. Further, it was possible to ask about satisfaction with the plan in each case. Finally, it was possible to develop a meaningful set of self-efficacy questions for each behavior involved. These tasks are described further in the methods sections.

CHAPTER II

METHOD

Study 1

Subjects

Subjects were 70 men and 82 women from introductory psychology classes. Each subject was run in a same sex dyad with a research assistant acting as another subject.

Procedure

During a preparatory interview, the experimenter told each subject that he/she would participate in a 10 minute conversation with one other subject. Subjects were told that we were interested in seeing how a variety of kinds of conversational styles and personal attributes affect conversations. However, in fact, all subjects were given the same task: Dominate the conversation. Subjects were told that to get the conversation going, they would be asked to take about a minute to introduce themselves to each other and that after that they were to talk about at least three of six moderately controversial topics (e.g., Should X-rated movies be shown on campus?) for the rest of the time. This task is similar to the one used by Blumenfeld (1977). Then each subject was told

> You have been randomly selected to play the role of a person who dominates the conversation. By 'dominating' we mean that you should be able to manage the conversation, direct it as you wish, and generally control what is talked about, and for how long. That is, we mean that you and the other person should be talking about the topics that you introduce. We also mean that the other person should be agreeing with you--or at least

not disagreeing with you--on any subject that you talk
about.

Development of Individual Plans.   To elicit individual

plans for dominating the conversation, the experimenter said

> Since it is important that you play this role well. I
> am going to give you five minutes or so to write out a
> plan for how you will go about dominating the conversa-
> tion.   I want you to write down, in as much detail as
> possible, exactly what you will do that will help you
> actually run the conversation the entire time.

Subjects were then given a piece of paper on which to write

down their plans.   The paper had the same instructions

printed on the top.

After about five minutes, the experimenter returned.

Without looking at the subject's written plan, the experi-

menter said in a nonevaluative way,   "I would like you to

look over your plan once more to see if there is anything

else at all that you might do--especially if what you

already have planned doesn't work." If any additional ideas

were suggested, the experimenter had the subject write them

down on the paper.

Rating the Quality of the Plans.   Individual written

plans for dominating conversations were rated by four

trained raters using criteria adapted from Blumenfeld

(1977), Folger (1980), Rogers and Ferace (1975), and Rogers

and Jones (1975).   The scoring form they used is shown in

Figure 4.

Assessment of Satisfaction with Plan. When the subject

completely finished with his/her plan, satisfaction with the

Figure 4

Form used to rate plans for dominating conversations.

Dominance Plan Scoring Criteria

Subject Number:_____   Coder Number:_____

Give one point for each general tactic included in the
plan. Give one point for a specific example of how a
general tactic might be implemented. A subject may get
one point for including a general tactic, or one point for
stating a specific way a general tactic might be used, or
two points for including both a general statement of the
tactic and a specific example.

	General	Specific
1. Talk as much as possible	_____	_____
2. Introduce the topics to be talked about	_____	_____
3. Keep the conversation on the topics you want to talk about	_____	_____
4. Interrupt often	_____	_____
5. Ask closed-end questions	_____	_____
6. Speak authoritatively	_____	_____
7. Get in the last word on any topic	_____	_____

plan was assessed by having the subject complete the form illustrated in Figure 5. The experimenter explained the form but had the subject fill it out alone and seal it in an envelope with the plan when completed.

As shown in Figure 5, there are three questions about satisfaction with the plan. Each question is followed by five seven-point scales. The first three scales (Good-Bad, Worthless-Valuable, Clear-Hazy) are from Osgood, Suci, and Tannenbaum (1957) and load .88, .79, and .59, respectively, on their evaluative factor (factor I). The last two scales (Complete-Incomplete, Inaccurate-Accurate) seemed like good semantic differential items for the questions asked and were included with the expectation that they would be well correlated with the first three scales. Since these scales were, in fact, highly correlated with the scales from Osgood et al., they were used in calculating a total satisfaction score for each subject. The total satisfaction score was calculated by summing all ratings on all scales for all three questions after reversing the scores for the Good-Bad, Clear-Hazy, and Complete-Incomplete scales. Reversing these scores made it so that for all scales a seven indicated the most positive rating and a one indicated the least positive rating.

Assessment of Self-efficacy Expectations. Self-efficacy expectations were obtained using the questionnaire shown in Figure 6. Again, the experimenter explained the

Figure 5

Form used for assessing satisfaction with plan for dominating the conversation.

Satisfaction with Plan

Please use the five scales listed below to rate your plan for controlling <u>what topics are discussed</u>. Circle one number on each scale.

```
+------+------+------+------+------+------+
1      2      3      4      5      6      7
Good                                    Bad
```

```
+------+------+------+------+------+------+
1      2      3      4      5      6      7
Worthless                          Valuable
```

```
+------+------+------+------+------+------+
1      2      3      4      5      6      7
Clear                                  Hazy
```

```
+------+------+------+------+------+------+
1      2      3      4      5      6      7
Complete                         Incomplete
```

```
+------+------+------+------+------+------+
1      2      3      4      5      6      7
Inaccurate                         Accurate
```

Please use the five scales listed below to rate your plan for controlling <u>when topics are discussed and for how long</u>. Circle one number on each scale.

```
+------+------+------+------+------+------+
1      2      3      4      5      6      7
Good                                    Bad
```

```
+------+------+------+------+------+------+
1      2      3      4      5      6      7
Worthless                          Valuable
```

```
+------+------+------+------+------+------+
1      2      3      4      5      6      7
Clear                                  Hazy
```

```
+------+------+------+------+------+------+
1      2      3      4      5      6      7
Complete                         Incomplete
```

```
+------+------+------+------+------+------+
1      2      3      4      5      6      7
Inaccurate                         Accurate
```

Please use the five sclaes listed below to rate your plan
for <u>getting the other person to agree with you</u>. Circle
one number on each scale.

```
+-------+-------+-------+-------+-------+-------+
1       2       3       4       5       6       7
Good                                          Bad
```

```
+-------+-------+-------+-------+-------+-------+
1       2       3       4       5       6       7
Worthless                                Valuable
```

```
+-------+-------+-------+-------+-------+-------+
1       2       3       4       5       6       7
Clear                                        Hazy
```

```
+-------+-------+-------+-------+-------+-------+
1       2       3       4       5       6       7
Complete                               Incomplete
```

```
+-------+-------+-------+-------+-------+-------+
1       2       3       4       5       6       7
Inaccurate                               Accurate
```

Put your plan and this form in the envelope provided.
Then please let the experimenter know that you are done.

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Figure 6

Form used for assessing self-efficacy expectations for
dominating a conversation.

Dominance Efficacy Scale

```
+----+----+----+----+----+----+----+----+----+
10   20   30   40   50   60   70   80   90  100
quite               moderately          absolutely
uncertain           certain             certain
```
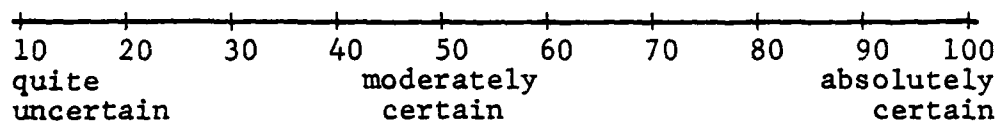
Use the scale above to answer the following questions.

                                              Can Do Confidence

If you make your very best effort in a
ten minute conversation with a stranger,
can you

1. Dominate the conversation for 2 minutes _____   _____

2. Dominate the conversation for 4 minutes _____   _____

3. Dominate the conversation for 6 minutes _____   _____

4. Dominate the conversation for 8 minutes _____   _____

5. Dominate the conversation for 10 minutes_____   _____

When this form is completed, please put it in the enve-
lope provided.

form but subjects completed it on their own and sealed in an envelope.

Order of Assessment. Half the subjects developed their plans first and half the subjects rated their self-efficacy expectations first. In all cases, satisfaction with the plan was assessed immediately after the plan was developed.

Additional Instructions to Provide Motivation. After all of the assessment procedures were done but before leaving the room where the assessment was done, the experimenter attempted to increase the subject's motivation to make a serious effort to dominate the conversation by saying

> Before I get you started on a conversation with the other person, I want to say that it is extremely important that you make your best effort to dominate this conversation. I also want to let you know that there will be an observer watching. If he decides that you have really been trying, we will give you an extra half hour of experimental credit.

In fact, all subjects were given the extra credit.

Conversation. The subject was taken by the experimenter to a room with a one-way window where the conversation was videotaped. The experimenter would then bring in a confederate and introduce him/her as another subject. The confederate was always the same sex as the subject. The experimenter started by saying

> We are interested in seeing how a variety of factors affect conversations. So we are going to ask the two of you to have a conversation about any three of these six topics (handing a list of topics to each person). To get things started, I want each of you to introduce yourself and talk about yourself for a minute. You can tell anything about yourself that you feel like sharing. I am going to leave now and I will be back in

about 10 minutes. (Looking at the confederate) So why don't you start by introducing yourself?

The confederate would give a standard introduction lasting about a minute unless he/she was interrupted in which case he/she would stop and not bother with completing the introduction. Approximately one minute (according to a clock in the room) after the subject started talking and regardless of what the subject was talking about, the confederate would say, "Maybe we'd better talk about . . . (introducing one of the topics on the sheet)." Approximately three minutes later he/she would say the same thing again and introduce another topic. Then approximately two minutes before the end of the conversation, the confederate would suggest another topic. At other times during the conversation, the confederate would simply respond to what the subject said, but always expressed a view mildly different from the subject's. Confederates attempted to produce a conversational tone like that in a discussion that considers alternative points of view without being an argument. They practiced this with each other and with trial subjects in order to assure a reasonably standard presentation. Additionally, they observed each other throughout data collection and received additional training as needed to help provide for continuing continuity across confederates.

Performance Measures. Four sets of three trained coders watched the videotaped conversations and rated subjects for dominance using the form shown in Figure 3. Every

Figure 7

Form used by trained coders to rate subjects' dominance.

Dominance Rating Form

Subject Number:_____   Coder Number:_____


```
+-----+-----+-----+-----+-----+-----+-----+
1     2     3     4     5     6     7
Not at all        Somewhat              Extremely
Characteristic    Characteristic        Characteristic
```

Subject	2.5	5	7.5	10	
Assertive					Assertive
Dominating					Dominating
Passive					Passive
Yielding					Yielding

Total time subject talked:_____

Total time conversation lasted:_____

Definitions

Assertive = A person who presents his/her point of view
    directly but not in a way that is aggressive or
    insensitive to the feelings of others.

Dominating = A person who manages and controls a conver-
    sation. He/she elicits agreement with his/her opinion.

Passive = A person who lets others control everything. He/
    she agrees to virtually anything the other person says.

Yielding = A person who will state a position and then back
    down when challenged. He/she may offer some resistance
    before giving in but always gives in.

two and a half minutes, they would stop the tape and rate the subject on four scales (Assertive, Dominating, Passive, Yielding). Definitions for these scales are shown in Figure 7. Scores on the Passive and Yielding Scales were reversed and added to the scores on the Assertive and Dominating scales to produce the coder's rating of a subject's dominance in the conversation. All three coders' ratings were added to produce a single score of dominance.

Folger (1980) has shown that floor time or the proportion of the total time a subject talks in a conversation is a reasonably good measure of dominance in a conversation. To provide a measure of floor time, two timers used stop watches to determine the amount of time that each subject talked during the conversation. The times from the two timers were averaged. The average time was divided by the total time the conversation lasted to give a measure of the proportion of the total time each subject talked.

Debriefing. All subjects were debriefed after the conversation. The rationale for the study and the expected results and implications were explained.

Study 2

Subjects

Subjects were 107 students in court reporting classes.

Procedure

Trained experimenters, who were not the regular classroom teachers, gave the following instructions to each class

of student court reporters, "We are doing research that has to do, in part, with what helps to produce well done transcriptions of question and answer testimony. I am going to be asking you to do several things today to help us with this research." At this point half the subjects were asked to develop their plans for producing a perfect final copy of a transcript of question and answer testimony and half were asked about their self-efficacy expectations for that task.

Development of Individual Plans. To elicit individual plans for doing the court reporting task, the experimenter gave each subject a piece of paper with the following instructions printed on the top,

> On this page, please write out a thoroughly complete
> plan for how you go about producing a perfect tran-
> script of question and answer testimony presented at
> the speed you are currently using in your own class.
> Write down each and every step of the process as if you
> were writing instructions for someone else to follow.
> If you have any questions about what to do, please
> raise your hand.

When a student finished writing his/her plan, the experimenter would say, "I would like you to look over your plan once more just to check to see if there is anything else you would include." If any additional plan was suggested, the experimenter would have the subject write it down. The subject would then put the plan in an envelope provided by the experimenter.

Rating the Quality of the Plans. Plans developed by subjects were rated by two trained raters using evaluation criteria developed in pilot work. The form they used is

shown in Figure 8. Each rater gave each subject a score which depended on the number of plan elements included in the plan. The two scores were averaged to give a measure of the quality of the subject's plan.

Assessment of Satisfaction with Plans. When the plan was completed, the experimenter gave the subject the form shown in Figure 9. This form was used for assessing satis- faction with the plan. As in Study 1, there are five scales following each question. The first three scales are from Osgood et al. (1957) while the last two scales were included as additional, potentially useful scales. They were evalu- ated in the same way as described for Study 1. As in Study 1, the two additional scales were highly correlated with the three taken from Osgood et al.; so, all five scales were used in computing subjects' satisfaction scores. When sub- jects had filled out the Satisfaction form, they put it in the envelope with their plan.

Assessment of Self-efficacy Expectations. Self-effi- cacy expectations were assessed using the form shown in Fig- ure 10. The experimenter explained the form but had sub- jects fill it out on their own and seal it in an envelope when completed.

Performance Measures. The regular classroom teachers presented a standardized two-voice question and answer tes- timony test at the speed and difficulty currently being used in the class. This was a regular, required test for the

Figure 8

Form used to rate plans for court reporting task.

Scoring Criteria for Court Reporting Plans

Subject Number:_____   Coder Number:_____

_____ 1. Read over machine notes.
_____   a. Clarify questionable outlines on notes.
_____   b. Make corrections in punctuation, pargraphing and so forth.
_____   c. Mark words which need to have spellings checked

_____ 2. Read over notes again.

_____ 3. Research unfamiliar words, names, addresses, and so forth.

_____ 4. Check the margins on the typewriter.

_____ 5. Set tabs so they are appropriate for type of testimony.

_____ 6. Type carefully.

_____ 7. Read ahead in notes to avoid confusion while typing.

_____ 8. Proofread the transcript.
_____   a. Proofread against machine notes.
_____   b. Check for spelling errors.
_____   c. Check for punction errors.

_____ 9. Proofread a second time.

_____10. Use a cassette recorder, if possible.

Figure 9

Form used for assessing satisfaction with the plan for
doing a court reporting task.

Satisfaction with for Court Reporting

Please use the five scales listed below to <u>rate your plan</u> <u>for insuring that you will have all the notes and informa-</u><u>tion</u> you need before you start to type. Circle one num-ber on each scale.

```
+--------+--------+--------+--------+--------+--------+
1        2        3        4        5        6        7
Good                                                  Bad
```

```
+--------+--------+--------+--------+--------+--------+
1        2        3        4        5        6        7
Worthless                                      Valuable
```

```
+--------+--------+--------+--------+--------+--------+
1        2        3        4        5        6        7
Clear                                              Hazy
```

```
+--------+--------+--------+--------+--------+--------+
1        2        3        4        5        6        7
Incomplete                                     Complete
```

```
+--------+--------+--------+--------+--------+--------+
1        2        3        4        5        6        7
Accurate                                     Inaccurate
```

Please use the five scales listed below to <u>rate your plan</u> <u>for insuring that your final typed copy is perfect.</u> Circle one number on each scale.

```
+--------+--------+--------+--------+--------+--------+
1        2        3        4        5        6        7
Good                                                  Bad
```

```
+--------+--------+--------+--------+--------+--------+
1        2        3        4        5        6        7
Worthless                                      Valuable
```

```
+--------+--------+--------+--------+--------+--------+
1        2        3        4        5        6        7
Clear                                              Hazy
```

```
+--------+--------+--------+--------+--------+--------+
1        2        3        4        5        6        7
Incomplete                                     Complete
```

```
+--------+--------+--------+--------+--------+--------+
1        2        3        4        5        6        7
Accurate                                     Inaccurate
```
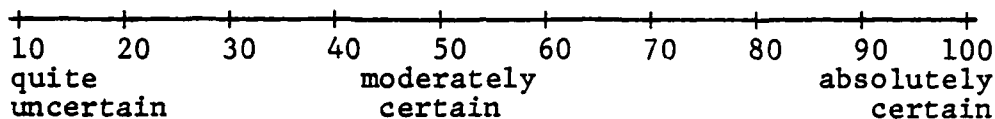
Put your plan and this form in the envelope provided. Then please raise your hand to let the experimenter know that you are done.

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Figure 10

Form used for assessing self-efficacy expectations for
court reporting task.

Court Reporting Efficacy Scale

```
+----+----+----+----+----+----+----+----+----+
10   20   30   40   50   60   70   80   90  100
quite               moderately          absolutely
uncertain           certain             certain
```

Use the above scale to answer the following questions.
For each question indicate your confidence that you can do
at least that well. If you have any questions about this
form, please raise your hand.

Can Do Confidence

In your own opinion and making your
very best effort,

1. Can you copy down all of a question
and answer testimony presented at the
level of difficulty and speed
currently being used in your class? _____ _____

2. Can you at least read back the test-
imony with only minor variations from
what was presented to you? _____ _____

3. Can you read back the testimony
exactly as it was presented to you? _____ _____

4. On your first try, can you produce
a transcript of the testimony that is
at least readable and makes sense but
needs to be retyped? _____ _____

5. On your first try, can you at least
produce a transcript which has only
minor errors that could be corrected
wothout retyping an entire page? _____ _____

6. On your first try, can you produce a
transcript that is at least 90 percent
accurate? _____ _____

7. On your first try, can you produce a
transcript that is at least 98.5
percent accurate? _____ _____

8. On your first try, can you produce a
transcript that is 100 percent
accurate? _____ _____

When completed, put this form in the envelope provided and
raise your hand to let the experimenter know you are done.

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students.   Each subject took the dictation and transcribed
it.   Of the original 107 subjects,   eighty-eight subjects
handed in a final copy of the transcript.   This was graded
by two trained graders using a standardized grading method.
The average of the two graders scores was used as the sub-
jects' performance measure.

CHAPTER III

RESULTS

The results for Study 1 will be presented first.   Then the results for Study 2 will be presented.

Results for Study 1

Descriptive Statistics.   Means, standard deviations and other descriptive statistics are shown in Table 1.

Reliability of Assessment Instruments.   The internal consistency and the inter-rater reliability of the plans for dominating the conversation were computed.   Figure 4 shows the form used for assessing the plans   that subjects developed.   The coefficient alpha was .853.   The intraclass correlation with four raters was .772.

Each subject evaluated his/her plan for dominating the conversation by completing the form shown in Figure 5.   The first three scales following each question (Good-Bad, Valuable-Worthless, Clear-Hazy)   were taken from the evaluative factor reported in Osgood, Suci, and Tannenbaum (1957).   The last two scales following each question   (Complete-Incomplete, Accurate-Inaccurate) were included as two additional scales.   To evaluate whether either or both of the additional scales should be used in computing subjects' satisfaction scores,   each additional scale was correlated with the sum of the three scales from Osgood et al.   For the Complete-Incomplete scale, r (152) = .844, p < .001.   For the Accurate-Inaccurate scale, r (152) = .833, p < .001.   These

Table 1

Descriptive Statistics

	Complete Sample			Path Analysis Sample*			Range	Minimum Possible	Maximum Possible
	N	Mean	SD	n	Mean	SD			
Study 1									
Plan Quality	152	1.75	1.06	141	1.74	1.05	0-6	0	14
Satisfaction	152	70.84	14.00	141	70.24	13.95	29-105	15	105
Self-efficacy	145	56.12	20.42	141	55.98	20.42	4-99	0	100
Coder Ratings	146	90.36	7.76	141	90.24	7.80	61-106	16	112
Proportion of Time	146	.55	.12	141	.54	.12	.28-.90	0	1.0
Study 2									
Plan Quality	107	4.66	1.95	88	4.86	1.89	0-9	0	16
Satisfaction	107	63.44	9.10	88	64.14	7.80	18-70	10	70
Self-efficacy	107	69.55	24.43	88	69.95	24.77	0-100	0	100
Performance	88	.96	.03	88	.96	.03	.845-.998	0	1.0

*Path analysis samples include only those subjects for whom scores are available on all variables.

correlations were considered high enough to use both additional scales in computing the satisfaction score. Coefficient alpha for the satisfaction questionnaire was .924 based on 152 subjects.

The self-efficacy questionnaire is shown in Figure 6. The strength scores were used as the measure of self-efficacy expectations. These were computed by summing the confidence estimates and dividing by five (the total number of estimates made). Based on 145 subjects, coefficient alpha was .836 for the self-efficacy questionnaire.

Coder ratings of how dominant subjects were and proportion of the total time the subject talked during the conversation were used as measures of dominance. Three raters evaluated the dominance of each subject using the form shown in Figure 7. Intraclass correlations were computed for each set of three raters. A weighted average intraclass correlation was computed by multiplying the number of subjects each set of raters rated by their intraclass correlation. The sum of these products was divided by the total number of subjects rated. The weighted average intraclass correlation was .873. A weighted average coefficient alpha was computed in the same way to evaluate the internal consistency of the ratings. This weighted average coefficient alpha was .891. For each subject, one of three sets of two coders timed the amount of time that the subject actually talked. Again, a weighted average intercoder correlation was computed in the

same manner as described above. The weighted average correlation was .955. The correlation between the sum of the coder ratings and the proportion of the time the subject talked was .628. df = 146, p < .001.

Effects of potentially confounding variables. The order of presentation of the self-efficacy questionnaire and the plan development task did not have a significant effect on the objective quality of the plan (F(1,150) = 2.369, NS), satisfaction with the plan (F(1,150) = 0.028, NS), self-efficacy expectations (F(1,143) = 0.280, NS), coder ratings of dominance (F(1,144) = 1.282, NS), or proportion of time the subject talked (F(1,144) = 0.665, NS).

There was no effect due to sex of subject on the quality of plan developed (F(1,150) = 2.70, NS), satisfaction with plan (F(1,150) = 0.423, NS), or self-efficacy-expectations (F(1,143) = 0.0, NS). However, there was a clear sex of subject effect on both performance measures (Coder ratings: (F(1,144) = 12.067, p < .001; proportion of time: (F(1,144) = 20.731, p < .001) with male subjects more dominant than female subjects.

There were no experimenter effects for quality of the plan (F(4,147) = 1.194, NS), satisfaction with the plan (F(4,147) = 1.647, NS), self-efficacy expectations (F(4,140) = 1.001, NS), or coder ratings of dominance, (F(4,141) = 1.697, NS. However, a one-way ANOVA with proportion of time subjects talked as the dependent measure did suggest an

experimenter effect, $F_{(4,141)}$ = 3.557, $p < .01$. Since female experimenters ran substantially more male subjects than did male experimenters, it seemed that these results might be due to the sex effect described above. An Experimenter by Sex ANOVA with unequal n using an ordinary least squares solution (cf. Overall & Spiegel, 1969) lends support to a sex effect interpretation. The main effect for experimenter ($F_{(4,136)}$ = 2.026, NS) and the Experimenter by Sex interaction ($F_{(4,136)}$ = 1.076, NS) were both nonsignificant. The main effect for sex was significant, ($F_{(1,140)}$ = 16.57, $p < .001$.

Finally, a one-way ANOVA suggested a confederate effect on both performance measures (coder ratings: $F_{(4,141)}$ = 2.962, $p < .05$: proportion of time talked: ($F_{(4,141)}$ = 6.337, $p < .001$). However, this result , too, is better explained as a sex effect since the confederate and the subject were always the same sex and since there were no significant differences between the two male confederates (coder ratings: $F_{(1,67)}$ = 0.0, NS; proportion of time: $F_{(1,67)}$ = 0.449, NS) or among the three female confederates (coder ratings: $F_{(2,74)}$ = 0.01, NS; proportion of time: $F_{(2,74)}$ = 2.428, NS).

It seemed from inspection that the sex effects identified might represent differences in the mean performance scores without representing any real differences in the relationships among the variables. Correlations between each

pair of variables were computed within sex. These
correlations are reported in Table 2. The differences
between the male and female correlations are reported in
Table 3. No significant differences were found between male
and female correlations. For this reason male and female
data were combined for the remaining analyses.

Tests of the Main Hypotheses. As predicted a signifi-
cant, positive relationship was found between the objective
quality of the plan and both performance measures. For
coder ratings the correlation was .309 (df = 144, p < .001)
while the correlation with proportion of time was .251, df =
144, p <.001.

Contrary to prediction, the relationship between objec-
tive quality of the plan and satisfaction with plan was non-
significant, r(152) = -.062, NS. For the 141 subjects used
in the path analysis (i.e., subjects for whom there were no
missing data), the correlation was .087, df = 139, NS.

The relationship between satisfaction with the plan and
self-efficacy expectations was significant (r(143) = .359, p
< .001) as predicted. For the 141 subjects used in the path
analysis, the correlation was .38, df = 139, p < .001.

The relationship between self-efficacy expectations and
the performance measures was also as predicted. The corre-
lation between self-efficacy and coder ratings was .241, df=
139, p < .01. The correlation between self-efficacy and
proportion of time was .123, df = 139, p < .10.

Table 2

Male and Female Correlations for Study 1

Males — Females	Quality of Plan	Satis- faction	Self- efficacy	Coder Ratings	Percent of Time
Quality of Plan		.0868 n = 70	.1118 n = 66	.3632*** n = 69	.1534# n = 69
Satis- faction	.0241 n = 82		.4014*** n = 66	.2135* . = 69	.1315 n = 69
Self- efficacy	-.0745 n = 79	.3307*** n = 79		.1321 n = 65	.0244 n = 65
Coder Ratings	.2311* n = 77	-.0136 n = 77	.3251** n = 76		.6381*** n = 69
Percent of Time	.3129** n = 77	.2037* n = 77	.2366 n = 76	.5774*** n = 77	

#$p < .10$

*$p < .05$

**$p < .01$

***$p < .001$

Table 3

Differences between Male and Female

Correlations for Study 1[a]

|	Quality of Plan	Satis- faction	Self- efficacy	Coder Ratings	Percent of Time
Quality of Plan		.0627	.1863	.1321	-.1595
Satis- faction	.063		.0707	.2271	-.0722
Self- efficacy	.187	.082		-.1930	-.2122
Coder Ratings	.147	.231	.204		.0607
Percent of Time	.170	.074	.218	.097	

[a]The upper triangle shows differences between male and female correlations (Male - Female). The lower triangle shows differences after the original male and female correlations were transformed to Z_r and then subtracted. Differences would have to be at least .283 for $p <$ .10 and at least .338 for $p <$ .05.

Hypothesis five called for a comparison of correlations between quality of plan and the performance measures with correlations between self-efficacy and the performance measures. There were no significant differences between the zero-order correlations or between the part correlations; but, as predicted, the plan-performance correlations (coder ratings: r_{41} = .288, $r_{4(1.3)}$ = .286, proportion of time: r_{41} = .223, $r_{4(1.3)}$ = .222) were consistently larger than the efficacy-performance correlations (coder ratings: r_{43} = .241, $r_{4(3.1)}$ = .239, proportion of time: r_{43} = .123, $r_{4(3.1)}$ = .121).

Path Analyses. Two path analyses were done to evaluate the model proposed by this paper. One used coder ratings as the final dependent measure and one used proportion of time the subject talked as the final dependent measure. The model as drawn for a path analysis is shown in Figure 11a. For simplicity of discussion, each of the variables will be referred to as they are labeled in Figure 11a. The correlation between satisfaction with the plan (X_2) and self-efficacy expectations (X_3) is equal to path coefficient p_{32}. Path coefficients p_{41} and p_{43} were estimated using the Ordinary Least Squares method (Lewis-Beck, 1974). The objective quality of the plan and the subjective satisfaction with the plan are considered exogenous variables in this model. The correlation between them is unanalysed--i.e., the factors which contribute to the correlation between them are not

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Figure 11

Path analysis models for an elaborated self-efficacy
model and for Bandura's original self-efficacy model.
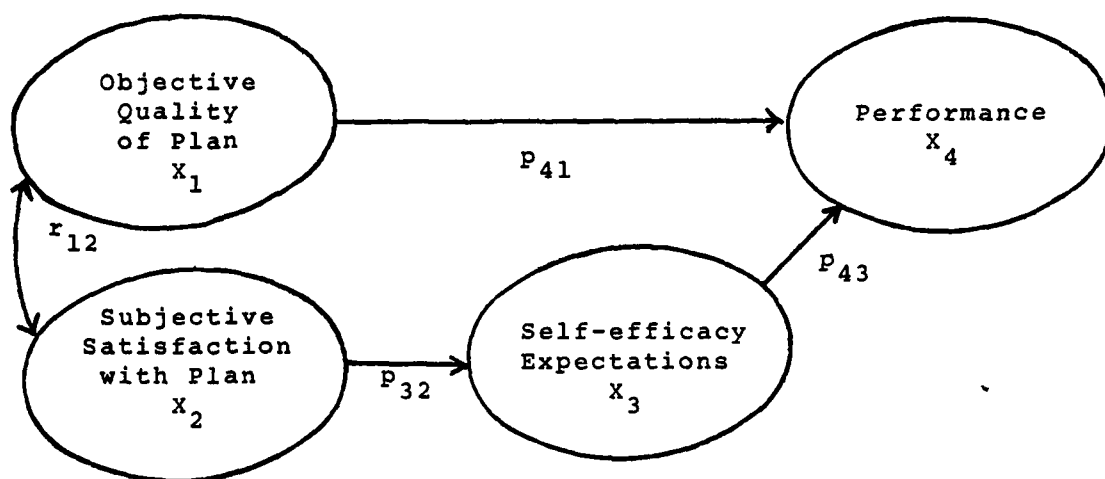
a
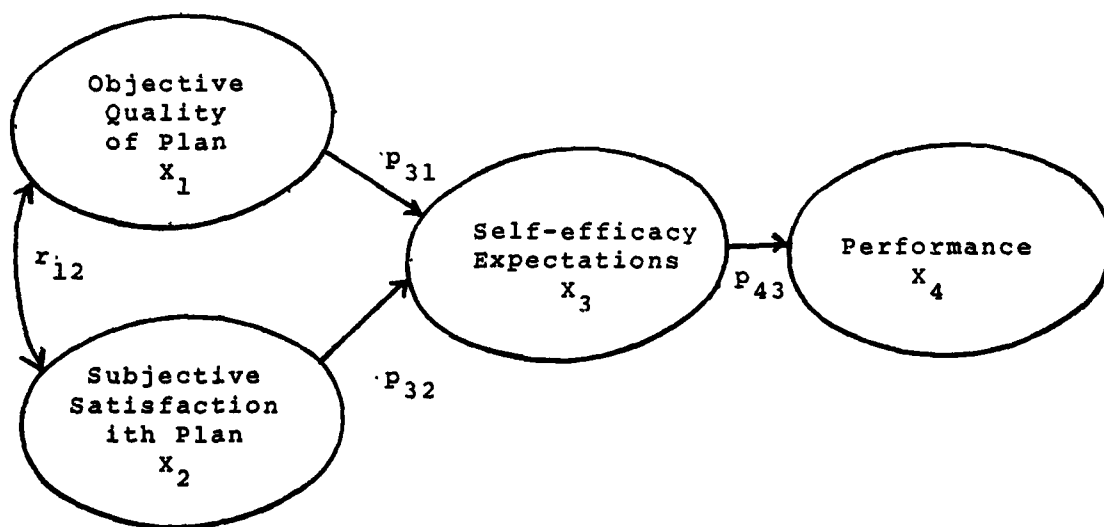
b

included in the model and the correlation between them is taken as a given.

Path coefficients for these path analyses are shown in Table 4. The proposed model makes predictions for two correlations. Specifically, the model implies that the direct effect of quality of plan on self-efficacy is zero and the direct effect of satisfaction with the plan on performance is zero. Therefore, the correlation between plan and self-efficacy is entirely due to the indirect effect of plan on self-efficacy as mediated by satisfaction with the plan. Similarly, the correlation between satisfaction and performance is due to indirect effects through quality of the plan and through self-efficacy expectations. Symbolically these predictions are stated as

$$\hat{r}_{13} = r_{12}p_{32}$$
$$\hat{r}_{24} = p_{41}r_{12} + p_{43}p_{32}$$

When coder ratings are used as the final dependent variable, $\hat{r}_{13} = .033$ and $\hat{r}_{24} = .116$. These differ from the obtained correlations by -.026 and -.021, respectively. Nunnally (1967) suggests that the average absolute value of the deviations is perhaps the best measure of the fit of a model. For this analysis the average absolute deviation is .024 which is certainly within the 95% confidence interval of approximately ±.17 for these correlations. The multiple R for the final dependent variable in this analysis was .374, $F(2, 138) = 11.25$, $p < .06$

Table 4

Summary of Path Coefficients, R's and R^2's

	Plan-Performance (p_{41})	Plan-Satisfaction (r_{12})	Satisfaction-Self-efficacy (p_{32})	Self-efficacy Performance (p_{43})	R	R^2
Study 1						
Proposed Model						
Coder Ratings	.2862***	.0875	.3802***	.2393**	.375***	.1402
Percent of Time	.2222**	.0875	.3802***	.1212	.254*	.0645
Original Model						
Coder Ratings	none	.0875	.3825***	.2413**	.241**	.0582
Percent of Time	none	.0875	.3852***	.1228	.123	.0151
Study 2						
Proposed Model	.1994#	.0849	.0097	-.0122	.200	.0401
Original Model	none	.0849	.0787	-.0233	.023	.0005

#p < .10, *p < .05, **p < .01, ***p < .001

When proportion of time is used as the final dependent variable, $\widehat{r}_{13}$ = .033 and $\widehat{r}_{24}$ = .066. These differ from the obtained correlations by -.026 and .131, respectively. The average deviation is .078. Again, each of the correlations and the average absolute deviation are well within the 95% confidence interval of approximately ±.17. The multiple R for the final dependent variable in this analysis is .254, $F(2,138)$ = 4.75, p < .05.

Two additional path analyses of these data were done using Bandura's (1977a) model in which he proposes self-efficacy as a central processor of relevant information. This model is shown in Figure 11b. In this model the objective quality of the plan and subjective satisfaction with the plan are again exogenous variables and their correlation is unanalysed. The path coefficients from quality of the plan to self-efficacy (p_{31}) and from satisfaction with the plan to self-efficacy (p_{32}) were estimated using the Ordinary Least Squares method (Lewis-Beck, 1974). The path coefficient from self-efficacy to performance (p_{43}) is the same as their correlation.

Bandura's model makes predictions for the correlations between plan and performance and between satisfaction with the plan and performance. These predictions can be written as

$$\widehat{r}_{14} = p'_{43}p_{31} + p_{43}p_{32}r_{12}$$
$$\widehat{r}_{24} = p_{43}p_{32} + p_{43}p_{31}r_{12}$$

When coder ratings are used as the final dependent measure, $\hat{r}_{14}$ = .002 and $\hat{r}_{24}$ = .124. These differ from the predicted correlations by .295 and -.029, respectively. The average absolute deviation is .157. The difference between the obtained and predicted correlations for performance with satisfaction and the average deviation are both within the 95% confidence interval of approximately ±.17 for these correlations. However, the difference between the obtained and the predicted correlations of performance with plan is clearly not within sampling error. This suggests that a model with a direct path from plan to performance would better describe the relationships among the variables in these data. The correlation between self-efficacy and coder ratings of performance (i.e., the equivalent of the multiple R in the path analyses of the proposed model) is .325, df = 139, p < .001.

When proportion of time is used as the final dependent variable, $\hat{r}_{14}$ = .001 and $\hat{r}_{24}$ = .047. These differ from the obtained correlations by .222 and .150, respectively. The average deviation is .186. Here the difference between the obtained and the predicted correlations for satisfaction with performance is within the 95% confidence interval of approximately ±.17 but neither the difference between the obtained and predicted correlations of plan with self-efficacy nor the average absolute deviation are within sampling error. As with the first path analysis of Bandura's model,

these results also suggest a poor fit of the model to the data and that a direct path from plan to performance may be indicated. The correlation between self-efficacy and pro-portion of time (i.e., the equivalent of the multiple R in the path analyses of the proposed model) was .123, df = 139, p < .10.

Evaluation of Exploratory Hypothesis. Eleven subjects had self-efficacy expectations in the bottom one-third of the distribution but, based on coder ratings, performed in the top one-third of the distribution (underestimators). Sixteen subjects reported self-efficacy expectations in the top one-third of the distribution but according to coder ratings performed in the bottom one-third of the distrib-ution (overestimators). The plan scores of the underestima-tors were significantly higher than the plan scores of the overestimators, $F(1,25)$ = 8.87, p < .01.

A similar analysis was done using proportion of time as the performance measure. In this analysis 14 underestima-tors were identified and 22 overestimators were identified. Again, the underestimators' plan scores were significantly higher than those of the overestimators, $F(1,34)$ = 4.394, p < .05.

To evaluate whether differences in self-efficacy might help account for discrepancies between the quality of the plan and eventual performance, two more one-way ANOVAs were done. For the first analysis, five subjects were identified

whose plan scores were in the bottom one-third of the distribution but who, according to coder ratings, performed in the top one-third of the distribution. Their self-efficacy scores were compared with 15 subjects whose plan scores were in the top one-third but whose performance scores were in the bottom one-third. Subjects with poor plans but good performance had significantly higher self-efficacy expectations, $F(1,18) = 6.562$, $p < .05$.

The same analysis was repeated using proportion of time the subject talked as the performance measure. Six subjects had poor plans but performed well. Fifteen subjects had good plans but performed poorly. No difference in self-efficacy expectations was found between the two groups, $F(1,19) = 0.581$, NS.

Results for Study 2

Descriptive Statistics. Means, standard deviations, and other descriptive statistics are shown in Table 1.

Reliability. Two raters rated each of the plans for the court reporting task using the form shown in Figure 8. Based on 107 subjects, the coefficient alpha for this form was .634. The interrater reliability was .775, $df = 105$, $p < .001$.

Each subject evaluated his/her plan for taking and transcribing question and answer testimony by completing the form shown in Figure 9. As in Study 1, the first three scales following each question (Good-Bad, Valuable-Worth-

less, Clear-Hazy) were taken from the evaluative factor reported in Osgood et al. (1957). The last two scales following each question (Complete-Incomplete, Accurate-Inaccurate) were included as two additional scales. To evaluate whether either or both of these scales should be used in computing satisfaction scores, they were correlated with the sum of the three scales from Osgood et al. For the Complete-Incomplete scale, $r(105) = .877$, $p < .001$. For the Accurate-Inaccurate scale, $r(105) = .808$, $p < .001$. Both scales were used in computing subjects' satisfaction scores. The coefficient alpha for this satisfaction questionnaire was .938.

The self-efficacy questionnaire for Study 2 is shown in Figure 10. Strength scores were computed by adding all the confidence estimates and then dividing by eight (the total number of estimates made). Coefficient alpha for the self-efficacy questionnaire was .892.

Of the 107 subjects who completed the plan development form, the satisfaction questionnaire, and the self-efficacy questionnaire, 88 completed the performance task and handed in a final transcript of the dictation. Two coders graded each of the 88 final transcripts. Intercoder reliability was .978, $df = 86$, $p < .001$.

Evaluation of Order Effects. The order of presentation of the self-efficacy questionnaire and the plan development task did not have a significant effect on the objective

quality of the plan ($F(1,105)$ = 2.119, NS), satisfaction with the plan ($F(1,105)$ = 2.739, NS), self-efficacy expectations ($F(1,105)$ = 1.573, NS), or performance ($F(1,86)$ = 0.658, NS).

Tests of the Main Hypotheses. As predicted, a significant, positive relationship was found between the objective quality of the plan and performance, $r(86)$ = .200, $p<.05$.

Contrary to prediction but similar to Study 1, the relationship between objective quality of the plan and satisfaction with the plan was nonsignificant, $r(105)$ = .085, NS. For the 88 subjects used in the path analysis, the correlation was -.102, df = 86, NS.

Also contrary to prediction but unlike the results for Study 1, the relationship between satisfaction with the plan and self-efficacy expectations was nonsignificant, $r(105)$ = .010, NS. For the 88 subjects used for the path analysis this correlation was .084, df = 86, NS.

The relationship between self-efficacy expectations and performance was also nonsignificant, $r(86)$ = -.023. This failed to support the hypothesized relationship.

As in Study 1, the relationship between the quality of the plan and performance ($r(86)$ = .200, $p < .05$) was stronger but not significantly stronger than the relationship between self-efficacy expectations and performance, $r(86)$ = -.023, NS. However, in Study 2, the difference between the part correlation of performance with quality of

plan holding self-efficacy constant $(\hat{a}_{4(1.3)} = .199$, $\underline{df} = 65$, $\underline{p} < .05)$ and the part correlation of performance with self-efficacy holding quality of the plan constant $(\hat{a}_{4(3.1)} = -.012$, $\underline{df} = 85$, NS) does reach the trend level, $\underline{t}(85) = 1.366$, $\underline{p} < .10$.

Path Analyses. A path analysis was done to evaluate the applicability of the proposed model to the data collected for Study 2. A second path analysis was done using Bandura's model. The path coefficients for these analyses are shown in Table 4 along with the path coefficients from Study 1.

As before, the proposed model makes predictions about the correlations between quality of plan and self-efficacy expectations $(\hat{r}_{13})$ and between satisfaction with the plan and performance $(\hat{r}_{24})$. For the data in Study 2, $\hat{r}_{13} = -.009$ and $\hat{r}_{24} = -.021$. These differ from the obtained correlations by -.047 and -.015, respectively. The average absolute difference is .031. This is easily within the 95% confidence interval of approximately $\pm.21$. The multiple $\underline{R}$ for the final dependent variable is .200, $\underline{F}(2,85) = 1.79$, NS. This suggests that the proposed model provides a fairly good fit for these data but that it accounts for a small proportion of the variance.

As before, the path analysis of Bandura's model made predictions about the correlations between quality of plan and performance $(\hat{r}_{14})$ and between satisfaction with the plan

and performance ($\hat{r}_{24}$). Based on the data in Study 2, $\hat{r}_{14}$ is predicted to be .001 and $\hat{r}_{24}$ is predicted to be -.002. These differ from the obtained correlations by .199 and -.005, respectively. The average absolute deviation is .102. The 95% confidence interval for these correlations is approximately ±.21. The correlation between self-efficacy and performance (the equivalent of the multiple $\underline{R}$ for the final dependent variable in the proposed model is -.023, $\underline{df}$ = 86, NS. This suggests that Bandura's original model provides an acceptable fit to these data but accounts for virtually none of the variance in the final dependent varible.

Evaluation of Exploratory Hypothesis. Thirteen subjects who had self-efficacy expectations in the bottom one-third of the distribution also had performance scores in the top one-third of the distribution (underestimators). Seventeen subjects who had self-efficacy expectations in the top one-third of the distribution turned out to have performance scores in the bottom one-third of the distribution (overestimators). The plan scores of the underestimators tended to be higher than those of the overestimators, $\underline{F}(1,28) = 3.238$, $\underline{p} < .08$.

Again a similar analysis was done to evaluate whether differences in self-efficacy expectations might help account for discrepancies between the quality of the plan and eventual performance. Nine subjects who had plan scores in the bottom one-third of the distribution also had performance

scores in the top one-third of the distribution. Thirteen subjects who had plan scores in the top one-third of the distribution also had performance scores in the bottom one-third of the distribution. No difference in self-efficacy expectations was found between these two groups, $F(1,20) = 0.186$, NS.

CHAPTER IV

DISCUSSION

There are a number of conclusions to be drawn from the results of these studies. Some are fairly immediate and clear, others are somewhat more remote and speculative. The more immediate ones include conclusions about reliability, confounding variables, and the degree to which the hypotheses of these studies are supported. These conclusions will be discussed first.

The reliability data for the instruments used in these studies are satisfactory in all cases and quite good in some. The only case where a statistic is really at the border of conventional acceptability is the coefficient alpha for the plan ratings in Study 2. Still it is in the acceptable range (Nunnally, 1978).

Of the potentially confounding variables, there is only one which seems to have shown a real effect. This was the sex of subject in the study which used dominating a conversation as the experimental task. The difference found between males and females in this study is certainly expected from prior research (Radecki & Jennings, 1980; Stake & Stake, 1979; Zimmerman & West, 1975). Still the differences in performance seem to reflect just that: Differences in the mean performance and not any real differences in what variables affected performance or how much one or another variable affected performance based on the sex of

the subject. For this reason, the data from the male and female subjects were combined into a single pool.

One of the clearest conclusions that can be drawn about the relationships among the four variables investigated in these studies is that there is a definite relationship between the quality of a person's plan for performance and his/her eventual performance. These results together with those of the path analyses suggest one main elaboration to Bandura's original model. Specifically, it seems potentially useful to include a person's plan for performing a task as an independent, direct determinant of performance. This will be discussed further below.

The results of the analyses done for the second hypothesis seemed curious at first. Clearly, the expected positive relationship between the objective quality of the plan and the subjective satisfaction with the plan was not found. This could reflect a poor understanding on the part of the subjects in both studies of what constitues a good plan. Similarly, a general lack of experience at making this kind of a formal judgment about satisfaction may have contributed to this result. In either case, it may be that with more experience on these tasks, people would develop a better understanding of what behaviors contribute to a good performance and how to evaluate a given plan. To the extent that this happens, the correlation between quality of plan and satisfaction with the plan should get larger. This

seems like a reasonable possibility; however, Simon's (1960) work suggests a somewhat different explanation and leads to a prediction of no change in the relationship. In his work on decision making, he discusses the concept of "satisific- ing." Simon suggests that when making decisions, people do not usually consider each and every possibility in an effort to reach the best possible decision. Instead, people tend to select the first satisfactory or acceptable decision or solution that comes along. In an effort to conserve per- sonal energy for more personally important activities, sub- jects may well have written down the first plan that occur- red to them rather than the very best plan they could possibly write. When asked how good their plans were some subjects may have been considering how good a plan they could have come up with if they had tried harder. These subjects would have indicated less than maximum satisfaction or even relatively low degrees of satisfaction. Other sub- jects may have been considering only whether their plans were good enough to get by. They could easily have been quite pleased with their plans and expressed a high degree of satisfaction. Thus, people with strictly equivalent plans could well have expressed substantially different degrees of satisfaction which would result in smaller corre- lations between satisfaction and other variables.

A third possibility exists for the lack of relationship between quality of the plan and satisfaction with the plan.

A number of researchers in various fields have failed to find a relationship between objective characteristics of a situation and satisfaction with the situation. Barrera (1981) found no relationship between a number of objective indicators of social support and satisfaction with social support. Schneider (1976) discusses data which clearly show there is no relationship between objective measures of quality of life in cities and subjective evaluations of life in those cities. Gutek, Allen, Tyler, Lau, and Majchrzak (in press) also found no relationship between objective indicators in a number of environments and satisfaction with those environments. They believe that judgments about satisfaction are based, in part, on internal considerations such as level of aspiration and perceived control. These internal considerations may well be totally unrelated to objective measures of quality.

What all of this means is that it may be very difficult to ever show a positive, significant relationship between quality of plan and satisfaction with the plan. If the low relationship is due to subjects satisficing, future researchers might find it helpful to ask subjects about (a) how good is the plan in terms of just getting by and (b) how good the plan is as compared to the best plan possible. How good the plan is in terms of just getting by should be more strongly related to objective quality of the plan. If the low relationship is due to internal considerations as sug-

gested by Gutek et al., these considerations should be assessed or some attempt made to hold them constant. This would allow for a clearer evaluation of the relationship between objective quality of the plan and satisfaction.

In Study 2, the shape of the distribution of satisfaction scores probably attenuated the correlation of satisfaction with quality of plan, as well as with other variables. The distribution is extremely peaked (kurtosis = 5.627) and negatively skewed (skewness = -2.13). Unfortunately, there is no way to determine how much the shape of the distribution has affected these correlations (Nunnally, 1978). Additionally, the mean of the satisfaction scores was less than one standard deviation below the maximum possible score. All of these statistics together suggest that there is a ceiling effect on all correlations involving satisfaction with the plan in Study 2. It must be remembered, though, that there was no ceiling effect on satisfaction in Study 1 and the correlation between quality of plan and satisfaction was still nonsignificant.

The expected relationship between satisfaction and self-efficacy expectations was not demonstrated in Study 2, but this can probably be attributed to the ceiling effect just described. However, for Study 1 there was a strongly significant, positive relationship between satisfaction and efficacy. This finding has implications for teasing apart the multivariate nature of self-efficacy. Satisfaction with

the plan accounted for approximately 14 percent of the variance in the self-efficacy expectations for Study 1. These results suggest that one important piece of information for the self-efficacy central processor is the degree to which a person is satisfied with his/her plan for performing a particular task. In more everyday words, how well people think they will do depends in part on the degree to which they think they know what they are doing. Certainly there are other variables that can be identified as affecting self-efficacy, but satisfaction with the plan seems like one which may be quite useful.

The predicted positive relationship between self-efficacy expectations and performance was clearly demonstrated in Study 1. Although this relationship has previously been demonstrated for a variety of behaviors (e.g., control of phobic anxiety, self-control, cognitive skills), this is really the first demonstration that self-efficacy expectations can predict performance of social behaviors. It may be that failure to show this relationship in Study 2 is due to a ceiling effect in the distribution of performance scores. The mean performance score is only 1.25 standard deviations below the maximum possible score. Perhaps with a more sensitive measure of performance, the efficacy-performance relationship would have been significant as well as the plan-performance relationship, which already did reach the .05 level of significance.

Hypothesis five predicted that the quality of plan should contribute more to performance than self-efficacy does. This prediction was evaluated by comparing the correlations between quality of plan and performance with the correlations between self-efficacy and performance. In both studies the zero-order and part correlations between quality of plan and performance were nonsignificantly larger than the zero-order and part correlations between self-efficacy expectations and performance. Based on these data, the most that can be said is that there were six comparisons which are in the direction predicted but which do not show significant differences. The logic behind this hypothesis was that the quality of plan contributed directly to performance as well as contributing indirectly to self-efficacy through satisfaction and, thus, affected performance further by affecting self-efficacy expectations. However, the indirect effect on efficacy is not demonstrable with these data since the correlations between quality of plan and satisfaction with plan were essentially zero. If future research is able to demonstrate a relationship between quality of plan and satisfaction with plan, then this hypothesis can be evaluated again.

The path analyses for the proposed model show that the differences between obtained and predicted correlations are not only within sampling error but are, in fact, quite small. This suggests that the results of both studies pro-

vide support for the proposed model. Comparison of the path
analyses for the proposed model to the path analyses for
Bandura's original model have to be done on kind of an eye-
ball basis since there is no formal procedure for making
this kind of comparison (Bentler, 1980). The proposed model
seems to do a generally better job of describing the rela-
tionships among the variables. As discussed above, it seems
important to include a direct path between the quality of
plan and eventual performance as is done in the proposed
model. Actually, this elaboration is also suggested by
Schunk's (1981) findings in his study involving children who
were having trouble with arithmetic. Schunk (1981) and Ban-
dura and Schunk (1981) found that those children who were
taught the correct algorithms for solving long division or
subtraction problems, improved on arithmetic tests. In
effect, they were teaching these children the best possible
plan to use. Schunk's path analysis of his data suggested
that a direct path from treatment to performance was needed.
This is equivalent to saying that those children who had
been "treated" by teaching them good plans did better than
those who had not been given good plans. Therefore, treat-
ment simply manipulated the plan variable. These results
are consistent with those found in the two studies reported
in this paper.

There may be some question about whether it will always
be important to include a plan path. The answer probably

depends on what the question is. In Bandura's original efficacy research (Bandura & Adams, 1977; Bandura et al., 1977), he compared several forms of treatment for snake phobias. All forms of treatment taught essentially the same plan. In effect then, Bandura held the plan variable constant, teaching a plan to those who needed it and reminding those who already knew it. This allowed him to give a clear demonstration of the importance of self-efficacy expectations. In either therapy or research, one way to decide whether plans or self-efficacy should be emphasized will be to think in terms of a learning-performance distinction. When first learning new behaviors or skills, the quality of a person's plan will be important for making predictions about performance. If the quality of plan is held constant, as when it is effectively as complete and accurate as it needs to be, then self-efficacy expectations will be more important for predicting performance. The general conclusion drawn is that the quality of a person's plan for performing a task has an important, direct effect on performance. Thus it is important to look at not only people's confidence that they can perform specific tasks, as suggested by self-efficacy theory, but also at whether people know which skills are relevant.

Although the path analyses suggest the proposed model provides a good fit to the data, the magnitude of the multiple R's--especially for Study 2--clearly suggest that there

are also other variables which are important in accounting
for the final performance of the task. To state these ideas
somewhat differently, the proposed model adequately
describes how the variables affect each other. However,
there are other variables which might be included in a
larger model or a model more specific to the situation. For
example, Bandura's original self-efficacy theory includes
outcome expectations. This is a variable which has received
relatively little attention in self-efficacy research to
date, but which could be useful in developing a more com-
plete path model. Generally, the approach in self-efficacy
research has been to treat outcome expectancies as positive
and constant. Future research may want to assess or manipu-
late outcome expectancies as a variable which, along with
self-efficacy, affects people's intentions to actually try
performing the behaviors in question. This should result in
a path model which accounts for more of the total variance.

The results of the analyses for the exploratory hypoth-
esis demonstrated that the quality of a person's plan for
performance of a task was helpful in explaining incongruen-
cies between self-efficacy expectations and eventual per-
formance. This is of some importance since self-efficacy
theory does not currently provide a clear explanation for
the incongruencies between expectations and performance
which have been found between 10 and nearly 50 percent of
the time. It is of practical as well as theoretical inter-

est to understand the the factors that contribute to people not being able to predict accurately what they will and will not do. Assessment of a person's plan for performance should allow for an explanation and lead tc more accurate predictions of performance. The converse does not seem to always be true since there was a significant difference in self-efficacy expectations between the poor plan-good performance group and the good plan-poor performance group in the ANOVA using coder ratings of dominance as the performance measure but not in the ANOVA using proportion of time the subject talked or for the corresponding ANOVA in Study 2. One way of thinking about this is in terms of the degree to which a person actually uses his/her plan for performing a behavior. People in the poor plan-good performance group who have high efficacy expectations could be expected to use every bit of the plan they had. Although they had a poor plan, they would use it fully and perhaps even improve on it as they worked. This would lead to a good performance. Within the group of good performers, those with poor plans probably would not do as well as those with good plans and equal self-efficacy expectations. The good plan-poor performance group would be those whose efficacy expectations were so low that they did not make much effort to use their perfectly good plans since they never intended to do the behavior in the first place. Thus, when self-efficacy greatly affects intentions to even try using a plan for per-

formance, discrepancies between quality of plans and level of performance may be attributable to level of efficacy expectation. The data for the studies in this paper do not allow a careful evaluation of this hypothesis so this remains a possibility for future research.

Another possible area for future research is suggested by the differences in results for the two studies. Study 1 involved use of established social skills while Study 2 involved motor skills which the subjects were in the process of developing. Other research suggests that in the initial stages of developing a specific fine motor skill, the relationship between self-efficacy expectations and performance is not particularly strong (Moe & Zeiss, Note 5). It may be speculated that the relationship between efficacy and motor skills--especially as they are developing--is more dependent on prior performance than is the relationship between efficacy and more cognitive or verbal behaviors. This could be due to the relatively more observable nature of the variables affecting verbal and cognitive skills. A person about to try to dominate a conversation can mentally review the skills and tactics that seem appropriate. However, for a motor task, the only way to review the current state of reflexes is to try them. When a person is developing a motor skill, it may be relatively harder to observe the changes in relevant variables (e.g., reflexes) than it is to observe changes in the variables relevant to highly verbal

or cognitively mediated tasks. The data for the studies in this paper do not allow a more exact evaluation of questions about whether self-efficacy expectations have a different relationship with motor skill performances than with more cognitive, verbal behaviors. Neither is it possible to look more closely at how self-efficacy expectations are related to developing motor skill performance. These are areas for future research.

Implications for Therapy and Education

One possible application of the findings in these studies will be in the area of therapy. A therapist who is interested in helping a client overcome a deficit of some kind can evaluate both a person's plan for performing a behavior and his/her satisfaction with that plan. If the plan is good but the person is dissatisfied with it, self-efficacy expectations are likely to be low. In this case, the therapist may want to use a cognitive intervention rather than a more enactive, behavioral one. On the other hand, a careful behavior analysis may reveal that the person's plan for performing is incomplete or inaccurate. In this case, the therapist may want to take more of an educational, skill development approach aimed at improving the client's plan for performing the task. If a therapist has both a good idea about how well a client knows what needs to be done as well as how to do it and has a good idea about the client's self-efficacy expectations with regard to par-

ticular tasks, the therapist should be able to predict reasonably well how the client will do at performing the behaviors in question. More importantly, the therapist will be better able to shore up the client's deficiencies and concentrate efforts where they are most needed.

Similar comments would also apply to educational and training situations. The results suggest that educators should place a dual emphasis on plan development and increasing self-efficacy expectations. The plan development would involve teaching the basic steps to performing a task or doing a skilled behavior. Bandura and others (Bandura & Adams, 1977; Bandura, et al., 1977) have shown that self-efficacy expectations can best be increased through actually performing the skills being developed. In an educational setting, this simply involves having the student do the task, perhaps in graded steps as was done in Bandura and Schunk (1981) and in Schunk (1981). Similarly, if a student is not progressing as expected, it would be helpful to assess both the student's plan and his/her self-efficacy expectations rather than assuming he/she simply needs more time in the classroom or, alternatively, that he/she just needs a little more confidence.

These comments about therapy and education reflect the general implications of this paper. Self-efficacy theory is concerned with prediction of behavior and behavior change. The results reported here provide additional support for

Bandura's basic idea that self-efficacy expectations can be a powerful predictor of behavior. The results also suggest that a person's plans for performing a behavior have an important, direct effect on that behavior.

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5. Moe, K. O., & Zeiss, A. M. *Causal modeling in the development of self-efficacy expectations for skilled performance*. Paper presented at the Western Psychological Association Convention, Sacramento, April 1982.

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BIOGRAPHICAL SKETCH

Karl Owen Moe was born in Cedar Falls, Iowa, on October 1, 1949. He received his elementary and secondary education in the Cedar Falls public school system. In 1968 he entered St. Olaf College, graduating Magna Cum Laude in 1972 with majors in Mathematics and Psychology. He entered the Air Force in November 1972. While in the Air Force he received a Master of Science in Systems Management from the University of Southern California and a Master of Arts in Counseling from Pepperdine University. In August 1978, he was assigned by the Air Force as a full time student at Arizona State University in the Clinical Psychology Program. He received a Master of Arts in Psychology in May 1980. He is married to Lanesta Mathis Moe. They have a keeshond named Durango who has kept Lanesta company while this dissertation was completed.

Course Syllabus

Human Services 6381G - Methods of Research
Summer I, 1982
St. Mary's University
Instructor: Dick Eiles, Ph.D.

Required Textbook: <u>Handbook</u> <u>in</u> <u>Research</u> <u>and</u> <u>Evaluation</u>
by Stephen Isaac and William Michael

<u>Course Objectives</u>:
    1. Acquire a knowledge and appreciation of the role
of research in counseling people.
    2. Acquire the ability to critically evaluate research
in the behavioral and social sciences.

<u>Specific</u> <u>Learning</u> <u>Objectives</u>:
    1. Understand and describe the basic fundamentals
and methods of conducting research.
    2. Calculate measures of central tendencies and
dispersion.
    3. Utilize the normal curve in describing an individual
relative to others.
    4. Use descriptive statistics; acquire a beginning
understanding of inferential statistics.
    5. Begin to identify flaws in research design and
reports.
    6. Acquire a more positive emotional reaction towards
research and statistics.

<u>Course Requirements</u>:
    1. Midterm and Final Exams
    2. Oral reports of at least four published research
articles relevant to counseling.
    3. Class attendance is critical.

<u>Course Schedule</u>:

June 2	Introduction, Variables, Measurement Scales
June 7, 9	Types of Research; strengths and weaknesses of each. Introduction to Sampling and Probability Theory (very basic); Descriptive Statistics, 6-11, 13-27, 146-147, 142-143, 124.
June 14, 16	Concept of variance and error - the Normal Curve and Tests, 73-91, 117.
June 21	Midterm Exam
June 23	Surveys Research- Interviews, Questionnaires, 92-99.
June 28, 30	Ex Post Facto Designs, Correlational Research 120. 148-151.
July 5, 7	Unobtrusive Methods, Webb et al, Isaac, 62-63.
July 12, 14	Experimental Design, Internal and External Validity, 31-61.
July 19	How to conduct and report research--you can do it! 1-5, 154-158.
July 21	Final Exam

Resource Material:

One book on reserve: <u>Unobtrusive Measures</u>
by Eugene Webb, et al

Handouts: 1. Basic Formulas and Examples for Calculating
Basic Measures
2. Applications of the Normal Curve
3. Checklist for Evaluating Research Articles
by me.

Note:

Don't allow the newness or unfamiliarity of new
terminology and concepts to erect an emotional barrier which
might prevent you from seeing and enjoying the richness of
research.
This course is designed for counselors--not methematicians.
If you are the latter you may encounter difficulties.